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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/538,004

06/03/2005

Akinori Taira

2611-0234PUS1

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EXAMINER

LEE, SIU M

ART UNIT

PAPER NUMBER

2611

NOTIFICATION DATE

DELIVERY MODE

01/27/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

**Supplemental
Notice of Allowability**

Application No.

10/538,004

Examiner

SIU M. LEE

Applicant(s)

TAIRA, AKINORI

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2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to IDS filed on 1/14/2010.
2. ☒ The allowed claim(s) is/are 16 and 25.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- * Certified copies not received: ____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date 1/14/2010
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date ____.
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other ____.

/CHIEH M FAN/
Supervisory Patent Examiner, Art Unit 2611

DETAILED ACTION

Allowable Subject Matter

1. Claims 16 and 25 are allowed.

2. The following is an examiner's statement of reasons for allowance:

The present invention describes a multicarrier radio communication system comprising a first communication device that transmits a signal and includes a transmitting antenna for each channel; a by-channel known-signal generating unit that generates known signals by channels, the known signals being spread by a code orthogonal between channels; a common known-signal generating unit that generates a common known signal that is common to the channels; and a transmission-signal generating unit for each channel that generates a transmission signal for a corresponding channel by allocating user data, the common known signal, and the known signals by channels according to a prescribed frame format, the transmission signal being a signal to be transmitted via corresponding antenna; and a second communication device that receives the signal from the first communication device and includes a receiving antenna for each channel; an initial synchronizing unit that establishes a timing synchronization and a frequency synchronization using the common known signal; and a by-channel known-signal extracting unit that extracts the known signals by channels from a reception signal for each channel, which is a signal received via the receiving antenna, after establishing the timing synchronization; and a

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despreading unit that despreads the reception signal with the orthogonal code based on information concerning the timing synchronization; a matched filtering unit that calculates channel impulse responses by channels from the signal that is despreaded; and a preceding-wave searching unit that determines a preceding wave position based on the channel impulse responses, wherein the by-channel known signal extracting unit extracts the known signals by channels based on the preceding wave position. The closest prior art, Ma et al. (US 2003/0072255 A1) in view of Ketchum et al. (US 2004/0179627 A1) together disclose a similar system except a preceding-wave searching unit that determines a preceding wave position based on the channel impulse responses, wherein the by-channel known signal extracting unit extracts the known signals by channels based on the preceding wave position. The prior art (Precise AFC scheme for performance improvement of SDM-COFDM by Yusuke ASAI, dated 2002) recited in the IDS filed on 1/14/2010 discloses a MIMO system that uses a common preamble and a by-channel preamble, however, the reference fails to disclose a by-channel known-signal extracting unit that extracts the known signals by channels from a reception signal for each channel, which is a signal received via the receiving antenna, after establishing the timing synchronization; and a despreading unit that despreads the reception signal with the orthogonal code based on information concerning the timing synchronization; a matched filtering unit that calculates channel impulse responses by channels from the signal that is despreaded; and a preceding-wave searching unit that determines a preceding wave position based on the channel impulse responses, wherein the by-channel known signal extracting unit extracts the known signals by

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channels based on the preceding wave position. This distinct feature has been added to claims 16 and 25, thus rendering claims 16 and 25 allowable.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SIU M. LEE whose telephone number is (571)270-1083. The examiner can normally be reached on Mon-Fri, 7:30-4:00 with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Siu M Lee/
Examiner, Art Unit 2611
1/19/2010

/CHIEH M FAN/
Supervisory Patent Examiner, Art Unit 2611